User Manual

Open platform
E Line

Part Number:	80860.850
Version:	1
Date:	2014-01-27
Valid for:	SB7ECS-OPENPLATL-0007

Version	Date	Modifications
1	2014-01-27	First edition

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Overall Table of Contents

1 Important Notes 4
1.1 Symbols 4
1.2 Safety Notes 4
1.3 Intended Use 4
1.4 Target Group 5
2 Introduction 6
2.1 Hardware and Software Requirements 6
3 PC Configuration 7
4 Operating Device Configuration 8
4.1 IP Address 8
4.2 Connection to Visual Studio 10
5 Visual Studio 11
5.1 Create Project 11
5.2 Device Settings 12
5.3 Library for Device Functions 14
5.4 Debugging / Deploying Project 15
6 Extended Configuration 16
6.1 Starting Project Automatically 16
6.2 Device Backup / Restore 17
A Index 18

1 Important Notes

1.1 Symbols

The symbols in this manual are used to draw your attention on notes and dangers.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER
This indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
This indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION
This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE
This symbol together with the signal word NOTE and the accompanying text alert the reader to a situation which may cause damage or malfunction to the device, hardware/software, or surrounding property.

This symbol and the accompanying text provide the reader with additional information or refer to detailed sources of information.

1.2 Safety Notes

- Read this manual carefully before using the software. Keep this manual in a place where it is always accessible to all users.
- The user manual, in particular the safety notes, must be observed by all personnel working with the software and the programmed device.
- Observe the accident prevention rules and regulations that apply to the operating site.
- Installation and operation must only be carried out by qualified and trained personnel.

1.3 Intended Use

- The software has to be used for programming operating devices exclusively. Every other use is not permitted.

1.4 Target Group

All configuration and programming work in connection with the automation system must be performed by trained personnel only (e.g. qualified electricians, electrical engineers).

The configuration and programming personnel must be familiar with the safety concepts of automation technology.

2 Introduction

This manual describes the configuration of Sütron operating devices with an open platform in use with the development environment of Microsoft Visual Studio.

2.1 Hardware and Software Requirements

The descriptions in this manual presuppose basis knowledge in handling Windows as well as programming knowledge which cannot imparted in this manual. If you should have any questions regarding this, we refer to the manuals for Windows or its online help.Your computer should at least have the following hardware and software requirements:

- Computer with 1.6 GHz or better,
- 512 MByte main memory (RAM) or better,
- 100 MByte free hard disk memory,
- CD-/DVD drive,
- mouse,
- Windows XP / Windows Vista / Windows 7
- Microsoft Visual Studio 2005 / 2008 Professional or Visual Studio Team System 2005 / 2008

3 PC Configuration

A requirement for creating a project in Visual Studio is the Sütron SDK for the E Line. The SDK must be installed to support the E Line as target platform.

Install SDK

1. Start the installation file „DK7ECS-ELINEARMV4I-xxxx.msi“on your PC.
2. Perform a complete installation of the SDK.

4 Operating Device Configuration

4.1 IP Address

To enable access to the operating device the following conditions must be filled:

– The operating device is connected with a network cable

– An ip address is configured or was allocated by the DHCP server

Some settings are password-protected. The default password is "+-+-".

Use the cockpit to display or adapt the ip configuration of the operating device.

Start cockpit at system startup

To start the cockpit, do the following:

1. Wait during the startup phase until the following dialog is displayed:

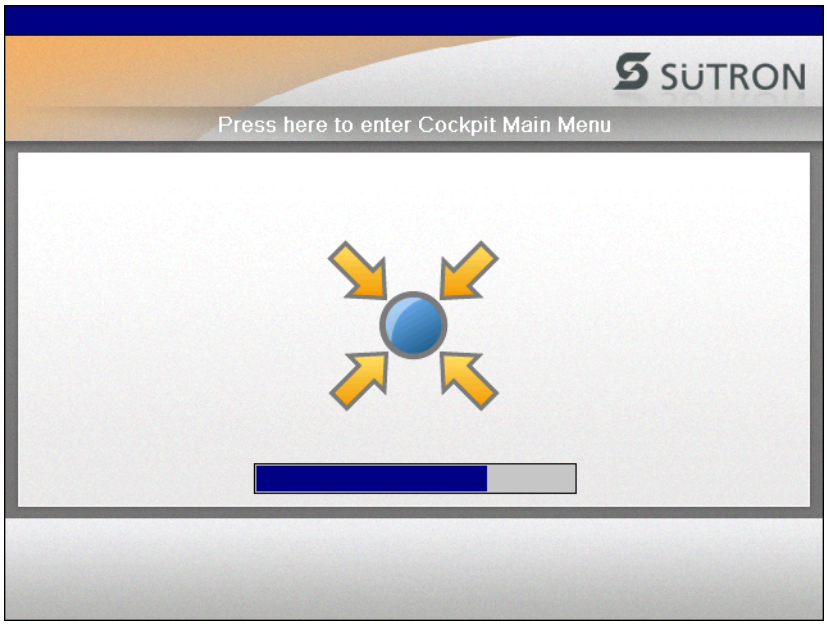

Figure 4-1 Cockpit startup phase

2. Press the button to start the cockpit before the progress bar is down.

You can customize the language of the cockpit interface at the language menu item.

3. Press the button **Language Selection**.
4. Select the desired language.
5. Confirm your selection with the green check.

Using desktop icon to start cockpit

You can start the cockpit via the desktop icon at already started operating devices with active desktop:

1. Briefly press twice on the desktop icon.
2. Press the button to start the cockpit before the progress bar is down.

You can customize the language of the cockpit interface at the language menu item.

3. Press the button **Language Selection**.

4. Select the desired language.
5. Confirm your selection with the green check.

Calling network settings

1. Press the **Network** button.

Following information is displayed:

– IP address,,
– Subnet mask,
– Gateway,
– Physical address (MAC)

Assign IP manually

If no DHCP server is present or the IP address should be assigned manually, proceed as follows:

1. Select the option **use static IP**.
2. Assign an ip address, subnet mask and gateway for the operating device.
3. Confirm your selection with the green check.

Assign IP automatically

With an existing DHCP server the IP address can be assigned automatically.

1. Select the option **Use dynamic IP (DHCP)**.
2. Confirm your selection with the green check.
3. Press the Network button and read the assigned IP address.

Please see further documentation to the configuration and administration from the device-specific user manual.

4.2 Connection to Visual Studio

The operating device is configured per default for a connection with Visual Studio 2008. To make this connection, a batch file (project.bat) is available in the flash memory of the device.

Execute project.bat

To make the connection to Visual Studio possible, execute the file project.bat:

1. Briefly press twice on the desktop icon.

2. Press the button to start the cockpit before the progress bar is down.

3. Press the button **Administration**.

Some settings are password-protected. The default password is "+-+-".

4. Press **Administration** to activate the area.
5. Press the **Start Batch File** button.

The batch file is executed.

6. Close the Cockpit.

The debug connection is closed automatically after long inactivity. In this case execute the file „project.bat “again to re-establish the connection.

5 Visual Studio

5.1 Create Project

Open Visual Studio and create a new project as follows:

1. Click in the menu **File -> New** on the entry **Project...**.

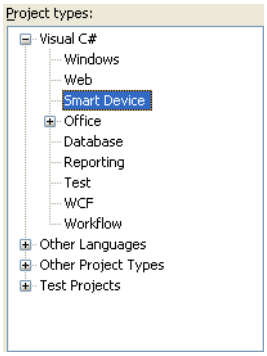

Figure 5-1 Project type

2. Choose the branch **Visual C# -> Smart Device** in the area Project types.

The template **Smart Device Project** should already be selected automatically.

3. Click on the button **OK**.

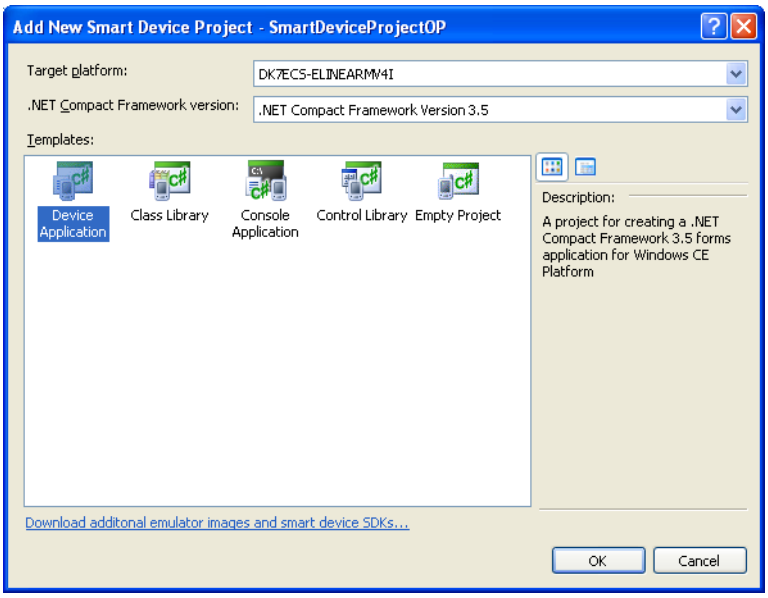

Figure 5-2 Add new Smart Device Project

4. Select the target platform **DK7ECS-ELINEARMV4I**, the **Compact Framework Version 3.5** and the template **Device Application**.
5. Click on the button **OK**.

Visual studio creates an empty form for the application.

To adapt the application to the proportions of the target device, carry out the following steps:

1. Mark the form **Form1**.

2. Select the entry **Size** from the property window and type in the width and height of the resolution of your operating device in pixels.

Please read the resolution of the display from the product specific user manual.

5.2 Device Settings

To connect Visual studio with the operating device, the following settings must be carried out:

1. Click on the button **Device Options**.

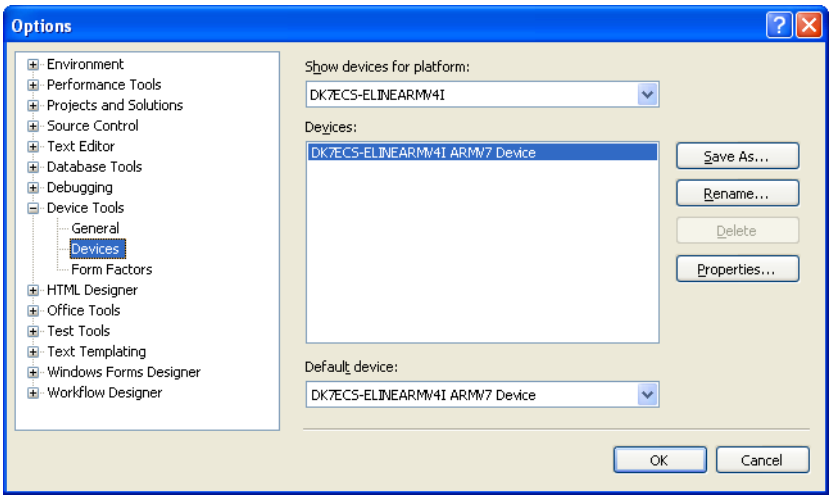

Figure 5-3 Device options

2. Select the branch **Devices** from the **Device Tools** tree.
3. Mark the entry **DK7ECS-ELINEARMV4I** in the **Show devices for platform** list box.
4. Select **DK7ECS-ELINEARMV4I ARMV7 Device** as **Default device**.
5. Click on the button **Properties...**.

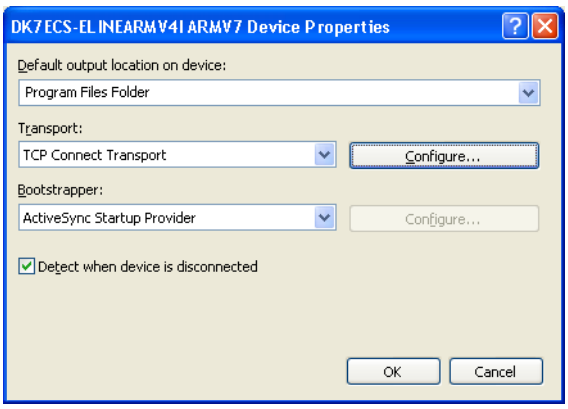

Figure 5-4 Device settings, properties

6. Click on the button **Configure...**.

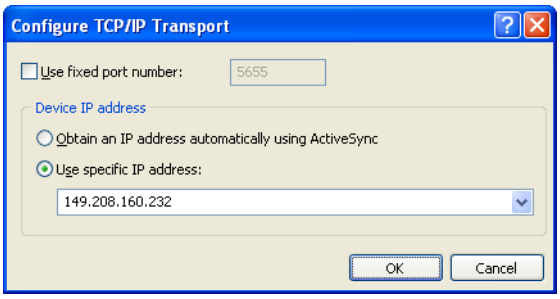

Figure 5-5 Device settings, configure TCP/IP transport

7. Select the option **use specific IP address** and enter the IP address of the operating device.
8. Confirm all dialogs with the button **OK**.

To define the output folder for the project, you still have to carry out the following steps:

1. Click on the entry **ProjectName Properties...** in the **Project** menu.
2. Select the tab **Devices**.

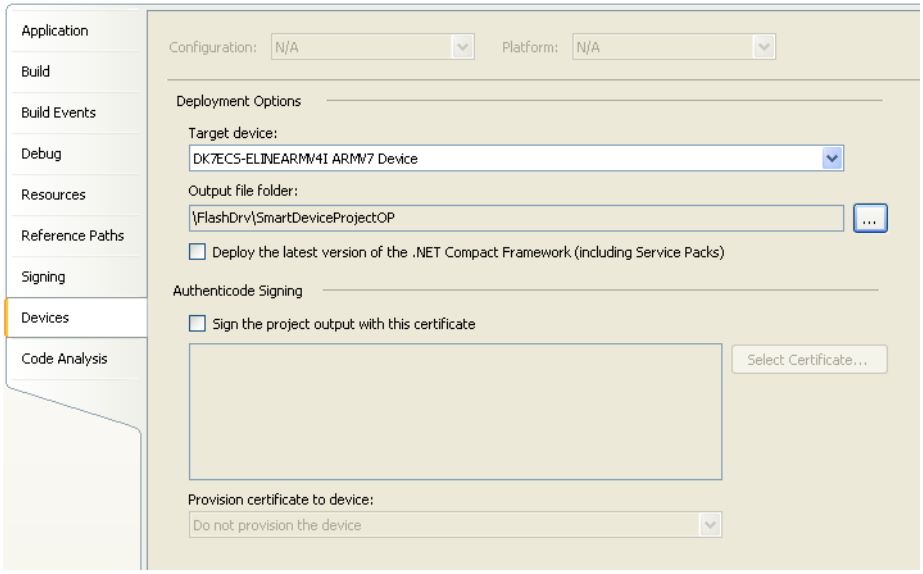

Figure 5-6 Project properties, devices

3. Remove the hook of the check box **Deploy the latest version of the .Net Compact Framework (including service packs)**.
4. Click on the button **...** on line **Output file folder**.

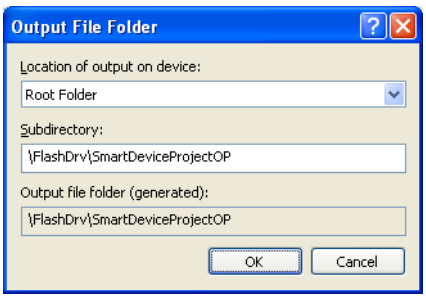

Figure 5-7 Project properties, output file folder

5. Select the entry **Root Folder** from the list box **Location of output on device**.
6. Enter the device memory and the project name to the field subdirectory (for example „\FlashDrv\SmartDeviceProjectOP“).

With the appropriate paths, different memory areas of the operating device can be accessed. Some paths are dependent on the product line of the operating device:

Product line(s)	Memory type	Path
All	USB stick	\HardDisk\
S Line, E Line, M Line, P Line	Internal	\FlashDrv\
E Line, M Line, P Line	Memory card	\StorageCard\

7. Click on the button **OK**.

5.3 Library for Device Functions

The installed SDK makes a library available for the access to device functions additionally. You have to add an reference to the library to use it in Visual Studio:

1. Click on the **Add Reference...** button in the project menu.
2. Click on the **Browse** tab.
3. Navigate to the following directory:

```
C:\Program files\Windows CE Tools\SDKs\DK7ECS-ELINEARMV4I\Dll\ARMv4I\
```

4. Select the file „SuetronDevice.dll“.
5. Click on the OK button.

5.4 Debugging / Deploying Project

The configuration of the operating device and Visual studio makes it possible to debug or deploy your project now.

Debugging

To transfer and debug the project to the operating device, you proceed as follows:

1. Click on the button **Start Debugging**.

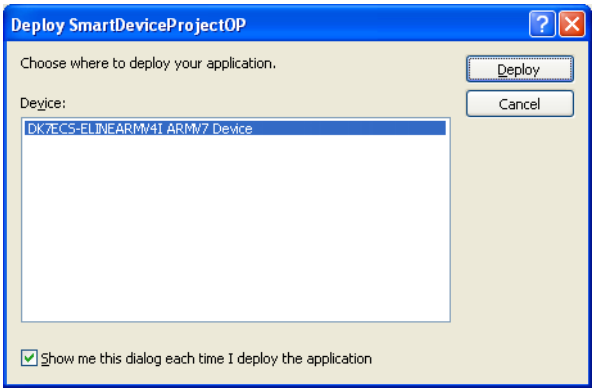

Figure 5-8 Debug project

2. Click on the button **Deploy**.

The project is transferred to the defined place and started.

Deploying

You can deploy the project also at the configured place:

1. Select the menu item **Deploy Solution** in the **Build** menu.

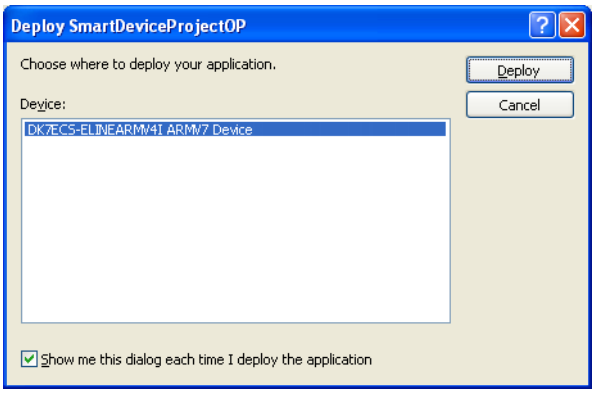

Figure 5-9 Deploy project

2. Click on the button **Deploy**.

The project is transferred to the defined place.

6 Extended Configuration

6.1 Starting Project Automatically

After the booting procedure the file starter.bat is automatically executed. You can use it to start the project automatically.

The project files should be copied and executed to the RAM memory for this purpose. This accelerates the access and prevents, that the project files - for example for updates - are blocked if these are executed at the moment.

You can modify the file starter.bat as follows:

1. Open your FTP program or the Windows Explorer and enter the ip address of the operating device as address (Example: ftp://149.208.160.232).
2. Download the file starter.bat to your local file system.
3. Extend the batch file with an editor (for example: Notepad):

```
REM Starter.bat
REM This batch-file will automatically start the application upon boot.
REM 1. Copy data from remanent storage to RAM disc
REM (remanent storage is either at:
REM \FlashDrv
REM 2. Start application executable
REM prepare directories for application in RAM disc
md \SmartDeviceProjectOP
REM copy application files from remanent storage to RAM disc
copy \FlashDrv\SmartDeviceProjectOP\*.* \SmartDeviceProjectOP
REM start application at RAM disc
cd \SmartDeviceProjectOP
start SmartDeviceProjectOP.exe
```

4. Save the batch file.
5. Upload the file to the operating device with the FTP program again and overwrite the old version.

At the next start of the operating device the project is copied automatically and then started.

6.2 Device Backup / Restore

A backup / restore of data (for example: Project data, start-up configuration etc.) in the permanent memory (Flash) on a USB stick is created as follows:

1. Start the cockpit.
2. Press the menu option **Update**.

Some settings are password-protected. The default password is "+-+-".

3. Press the **Backup** area.

Backup

Backup Device

1. Insert a USB stick into the female connector of the operating device.
2. Press the button **Backup Device**.

The files are copied to the directory "Backup" on the USB stick. If there is already a "Backup“ directory with data on the USB stick the backup is not performed.

The successful backup will be confirmed with a dialog.

Restore Backup

NOTICE
When restoring the backup all data in the flash memory of the operating device will be deleted.

The process of backup and restore all settings is possible only with identical device types.

1. Insert a USB stick into the female connector of the operating device.
2. Press the **Restore Backup** button.

NOTICE
Do not interrupt the power supply during the process. After canceling an process, the operating device may not be operational anymore.

The backup files are copied from the directory "Backup" to the flash memory of the operating device.

The successful update will be confirmed with a dialog.

3. Restart the operating device.

A Index

B

Backup 17

E

Extended configuration 16

H

Hardware requirements 6

I

Important notes 4
Intended use 4
IP address 8

O

Operating device
    Configure 8

S

Safety notes 4
Software requirements 6

T

Target group 5

V

Visual Studio 11
    Create project 11
    Debug project 15
    Deploy project 15
    Device settings 12